Jacobi (A)

GASTROTOMY

IN

STRICTURE OF THE ŒSOPHAGUS.

Box 9.

BY

A. JACOBI, M. D.,

CLINICAL PROFESSOR IN THE COLLEGE OF PHYSICIANS AND SURGEONS, NEW YORK.

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GASTROTOMY IN STRICTURE OF THE ŒSOPHAGUS.[1]

MATHILDA WEINBERG had seven children, the last twenty years ago, when she was thirty-two years old. All of her confinements were normal. She never suffered from her breasts while nursing. Her menstruation, during both her unmarried state and in the intervals between carrying and nursing her several infants, was regular and painless, until the age of nearly forty, when it suddenly ceased. About that period of her life she was taken ill, and suffered severely from headaches—to attacks of which she had been liable in former years—nervous prostration, hysterical attacks, and the symptoms of general hydræmia, for about nine months. Toward the close of this spell of sickness, she came under my notice. Emaciation, prostration, and hydræmia, were excessive; various hysterical symptoms intervened, such as globus, neuralgias, and œdematous swellings, so that it required removal from a dark and stifled tenement bedroom, good feeding, careful nursing, and constant encouragement, to enable her to trust her feet again. It was, when I saw her first, impossible to decide if, and which, local disease had initiated these severe symptoms more than half a year previously.

When her general health improved, her menses reappeared with some regularity. About this time, in 1861, she noticed a small, moderately hard, painless lump in her left breast,

[1] Read before the New York Academy of Medicine, June 18, 1874.

which gradually increased in size, until about the end of 1861, when I saw her again; the whole breast was then infiltrated with a hard mass, the surface being pretty smooth, the nipple retracted. The breast was removed about a year after the first appearance of the pseudoplasm; the wound healed kindly. Four months afterward, small lumps appeared at and near the inner extremity of the cicatrix, which was also removed, and proved scirrhous. Six months after the second operation, a lump of the same nature developed in, and was after some time removed from, the right breast. And a year afterward, in the cicatrix of the left side, and in the axillary glands, new deposits took place, which were removed in the fourth operation for that purpose. As, meanwhile, the case has been running its course over four years, as, moreover, the general appearance of the patient, though thin, fleshless, and emaciated, had not much changed, I reported its history at a meeting of the Pathological Society, and, in presenting the specimen, requested that a special committee be appointed for its microscopical examination, there being no regular microscopical committee in existence at that time. The committee reported, and declared the neoplasm to be scirrhous. After that time, new lumps would appear in rapid succession in the whole length of the cicatrix, and in the surrounding cutis, of a more or less rapid growth, with discoloration, from the size of a pea to that of a child's fist, and from the normal color of the integument to a purplish hue or a brownish, grayish tint. In a number of them, superficial or deep ulcerations would take place, some with a very offensive smell, some bleeding profusely in intervals, very few of them painful, though irritated, and only when an attack of erysipelas would set in. She had erysipelas after her last two operations, and had been liable to it some five or six times every year since, the first symptoms appearing, as a rule, in the neighborhood of a new ulceration; in some instances, however, over distant parts. Thus she had from ten to twelve attacks of erysipelas, extending over from five days to three weeks, up to the end of 1867, when numberless lumps of the above description covered the whole breadth of the chest horizontally, with a vertical range of from four to six inches. The use of the knife was dispensed with; lotions

of chlorate of potassa, of carbolic acid with glycerine, and of subsulphate of iron, were used almost incessantly, according to the changing indications. Besides, during a great part of 1867, she took from four to eight grains of carbolic acid daily, without any perceptible effect. About the beginning of 1868 I commenced an electrolytic treatment, nearly all of which was directed and administered by Dr. H. Guleke. He attended her regularly from the 18th of March to the 24th of May, 1868, employing eight elements of the largest Stoehrer galvanic battery, one electrode being applied to the sternum, the other to the indurations. On the 10th of April the pain in the principal lumps, which had been on the increase for some time, had almost disappeared. The indurations became smaller and paler. No more hæmorrhages. Ulcerations became smaller, the indurated edges softer. On May 24th, although meanwhile the treatment had to be interrupted because of a return of menstruation, and again by an attack of erysipelas, we noticed "complete cicatrization and almost complete disappearance of hardness in lumps and edges."

Still, this improvement was but temporary. The patient was so used to suffering, and so well pleased when life was just bearable, that under ordinary circumstances she would stay away for months, only to return now and then for advice, or the prescription of a medicine to be obtained at public expense.

During October, 1873, the patient noticed some difficulty in swallowing, and at times immediate return of ingesta into the mouth. The obstacle to this free passage she experienced just below the fauces. There was no nausea. When food reached the stomach, it occasioned no distress or vomiting, Dysphagia was much relieved by the occasional introduction of bougies, even when they could not be passed through the whole length of the stricture. She would come to my office once or twice a week, until in February, 1874, her visits had to become daily, or almost daily. At that time the stricture, which I found about eight inches behind the teeth, on a level with and a little below the cricoid cartilage, became more narrow, incapacitating her completely for partaking of solid food. No stomach-tube being admitted, I resorted to the use

of pointed French urethral bougies, of which No. 18 to No. 24 would readily pass. Meanwhile her appetite remained good, too good in fact for her difficulty in deglutition and suffering, while her bowels were rather constipated.

When she was admitted to the Mount Sinai Hospital, on April 8, 1874, she presented the above-mentioned appearance, with some additional enlargements of axillary lymphatic glands, another in the supra-clavicular region, and great emaciation and debility. Her viscera proved healthy. The uterus somewhat large. The treatment consisted, in the beginning, of the introduction of French bougies through the stricture twice daily, deodorizing applications to the scirrhous ulcerations of the breast, and the best possible liquid food.

On April 18th she was unable to swallow any thing, but a catheter was readily passed, and milk poured into the œsophagus from a fountain-syringe. I emphasize the fact that the instrument through which the injection was made, or rather through which the food was poured, was a catheter of common size, which reached but a little distance below the stricture, and certainly not through the cardia. It *disproves* the assertion that the whole length of the œsophagus, with its pharyngeal insertion, is required for the starting of peristaltic motion, and that in cases of œsophagotomy the simple pouring in of liquids through the fistula—without the cardia being passed by the sound—must necessarily prove ineffective. On April 19th she recommenced to swallow in her former way. Still the incident of the day previous hastened my intention to relieve the patient from her imminent danger of starvation, and before her strength should be too much reduced. Thus, after consultation with the other members of the medical board, and in the presence of a number of medical gentlemen of the city, I proceeded to perform gastrotomy April 24th, at 3 P. M.

The patient was on her back, chest and head but slightly raised, and anæsthetized. The incision was commenced below and between the cartilaginous ends of the seventh and eighth ribs, and was carried through the skin and subcutaneous muscular tissues, vertically downward, about two and a half inches. Several small arteries had to be ligated, although the

handle of the scalpel was employed more than the blade. Fascia transversalis and peritonæum having been divided, the omentum presented itself. Exploration by the finger exhibited the margin of the liver, the small curvature of the stomach, and pancreas, and inspection on pulling out the stomach, the venæ epiploicæ. Then a solution of bicarbonate of soda, followed by a solution of tartaric acid, was introduced into the stomach through a catheter passed beyond the stricture, for the purpose of inflating the stomach, of marking its outlines, and facilitating the incision through the anterior wall. The experiment, which had proved very successful a few days before, during my examination of the parts, failed to give satisfaction. Through the lower end of the opening into the peritonæum, about one and a half inch in length, I introduced a curved needle and silk ligature into and through the anterior wall of the stomach, which was held by pincers. It was thereby brought forward and held to the anterior wall of the abdomen. One and a quarter inch above this point the same proceeding was repeated, and between these fixed points the incision into the stomach was made, one inch in length. A little gas and very little mucous froth escaped, and an artery in the wall of the stomach was ligated. Eight silk ligatures were carried through the whole thickness of the stomach, about one-sixth or one-fourth of an inch from the incision, and through the external integument, sufficient to hold it in close juxtaposition and prevent any escape of fluids from the stomach into the abdominal cavity. Finally, a Carlsbad pin, and two silk ligatures besides, were used to close the external wound below the attachment of the stomach. Wet compress and bandage were applied, and, because of continued efforts at vomiting, a subcutaneous injection of sol. Magendie was made immediately after the operation.

At 5 P. M.—Pulse 70; extremities cool. Enema of two ounces of brandy-and-water.[1]

6 P. M.—Pulse 82, temperature 96.7. Beef-tea ℥ vj. Very quiet. No retching.

[1] To avoid repeating, I state here that all food and quinine were given in an enema; morphia, when no contrary statement is made, subcutaneously, and the temperature was always taken in the vagina.

9 P. M.—Milk ℥ vj, brandy ℥ j.

10 P. M. — Pulse 80, temperature 98.8. Beef-tea ℥ vj. Quiet. One slight effort to vomit.

April 25th, 2 A. M.—Pulse 90, temperature 98.8. Food, morph. gr. $\frac{1}{6}$. Quiet through the night.

6 A. M.—Pulse 90, temperature 100. Vomited some frothy fluid; severe retching. Morph. gr. $\frac{1}{6}$; either beef-tea or milk ℥ vj every two hours.

10 A. M.—Pulse 106, temperature 101.8. Nausea, thirst; ice-water with brandy in small quantities by the mouth. Bisulphat. quin. gr. x, and food retained.

11 A. M.—Morph. gr. $\frac{1}{6}$.

2.30 P. M.—Pulse 100, temperature 101.4. Slight dullness, on percussion from wound downward to the left, in hypochondriac and lumbar regions.

4 P. M.—Bisulphat. quin. grs. x. Some abdominal pain; cannot pass urine.

6 P. M.—Pulse 96, weak; temperature 101.2. Some straining sensation, but no evacuation from bowels; tenderness in left hypochondrium; ice-bladder.

8 P. M.—Bisulphat. quin. grs. x.

10 P. M.—Pulse 84, temperature 100.2. Vomited, once during the evening, about four ounces of brownish fluid. Morph. gr. $\frac{1}{10}$. About ℥ ij of brandy used in the milk injections through the day.

12 M.—Slept since 10 P. M. Retching again. Morph. gr. $\frac{1}{10}$.

26th, 2 A. M.—Pulse 84, temperature 99.6.

4 A. M.—Vomited a little.

6 A. M.—Pulse 92, temperature 100.4. Tongue dry, sleeps much; nausea as soon as the effect of morphia passes off; considerable infiltration of abdominal wall to left of wound, extending some distance posteriorly. Ice continued. Morph. gr. $\frac{1}{10}$.

8 A. M.—Bisulphat. quin. grs. x.

10 A. M.—Pulse 88, temperature 99.8. Nausea and retching. Morph. gr. $\frac{1}{10}$.

2 P. M.—Pulse 90, temperature 100.2; pulse weak. Vomited once some greenish material.

3 30 P. M.—Morph. gr. $\frac{1}{10}$.

4 P. M.—Quin. bisulph. grs. x.

6 P. M.—Pulse 92, temperature 100.4.

8 P. M.—Quin. bisulph. grs. x., morph. gr. $\frac{1}{8}$.

10 P. M.—Pulse 100, small; temperature 99.6. Faint.

12 M.—Slight retching. Morph. gr. $\frac{1}{8}$.

27*th*, 2 A. M.—Pulse 92, temperature 99.8. Slept quietly. Bisulph. quin. grs. x.

4 A. M.—Morph. gr. $\frac{1}{8}$.

6 A. M.—Pulse 92, temperature 100. Nausea, tenesmus. Morph. gr. $\frac{1}{8}$.

10 A. M.—Pulse 98, temperature 100. Quin. bisulph. grs. x. Enema of Leube's meat solution (substituted henceforth for beef-tea) ℥ j with water ℥ iv, and alternated with milk ℥ vj. Morph. gr. $\frac{1}{8}$. Tongue dry. Infiltration in left hypochondrium and lumbar region more extensive and marked; tenderness on pressure confined to this part of the abdomen, tympanites general, slight erysipelatous redness over abdomen, enemata retained, thirst. Acid muriat. in water, small quantities by mouth.

12 M.—Morph. gr. $\frac{1}{8}$ with beef-solution.

1 P. M.—Retching. Morph. gr. $\frac{1}{8}$.

3 P. M.—Pulse 90, temperature 99.8. Morph. gr. $\frac{1}{8}$, quin. grs. x.

7 P. M.—Pulse 100, temperature 100.2. Morph. gr. $\frac{1}{8}$.

10 P. M.—Pulse 96, temperature 100.7.

28*th*, 4 A. M.—Pulse 96, temperature 99. Quin. grs. x, morph. gr. $\frac{1}{8}$. Slept all night; some retching.

8 A. M.—Pulse 100, temperature 99.4. Quin. grs. x, morph. gr. $\frac{1}{8}$. Erysipelatous redness and infiltration extend posteriorly. Carlsbad pin and the two silk ligatures uniting the abdominal wound, also five of the eight silks from the fistula, removed.

2 P. M.—Morph. gr. $\frac{1}{8}$.

4 P. M.—Violent retching, soon relieved. Quin. grs. x, morph. gr. $\frac{1}{8}$ by enema.

6 P. M.—Pulse 78, temperature 99.3. Some pus can be pressed from the lower part of abdominal wound. Tympanites not quite so much; tongue moist.

10 P. M.—Pulse 80, temperature 98.8. Quin. grs. x, morph. gr. $\frac{1}{8}$.

29*th*, 1 A. M.—Morph. gr. $\frac{1}{6}$.

3 A. M.—Pulse 70, temperature 99. Sleeps quietly, head rather cool. Quin. grs. x.

5 A. M.—Morph. gr. $\frac{1}{6}$.

7 A. M.—Pulse 76, temperature 99. Morph. gr. $\frac{1}{6}$ in enema.

9 A. M.—Morph. gr. $\frac{1}{6}$.

11 A. M.—Quin. grs. x, morph. gr. $\frac{1}{8}$ in enema.

1 P. M.—Pulse 72, temperature 99. Morph. gr. $\frac{1}{10}$. Large evacuations of thin, yellow, fecal material, accompanied with escape of gas, odor very offensive; vomiting a little at the same time, no pain. The sensation of weight and tenesmus greatly relieved, tympanites less.

3 P. M.—Quin. grs. x, morph. gr. $\frac{1}{8}$ in enema.

5 P. M.—Pulse 68, temperature 99. Stomach washed out through fistula with a mild solution in water of bicarb. sod. Small quantity of Leube's meat-solution introduced through fistula. Morph. gr. $\frac{1}{6}$.

10 P. M.—Bowels moved again, same character of passages, a little vomiting.

11 P. M.—Morph. gr. $\frac{1}{8}$ in enema.

30*th*, 3 A. M.—Pulse 78, temperature 98.4. Tenesmus again. Quin. grs. x, morph. gr. $\frac{1}{6}$.

9 A. M.—Pulse 80, temperature 99. Quin. grs. x, morph. $\frac{1}{8}$ in enema. Erysipelas extends over the back, left side, and downward toward left thigh. Feels somewhat soft; elastic. Exploring needle brings no liquid.

3 P. M.—Pulse 96, temperature 102.3. Morph. gr. $\frac{1}{6}$ in enema at 1, now subcutaneously; bisulph. quin. grs. x.

5 P. M.—Pulse 100, temperature 102.9.

9 P. M.—Pulse 98, temperature 102. Bowels moved at 6 P. M. Fæces yellow, offensive. Morph. gr. $\frac{1}{6}$ at 6 P. M., at 10 P. M., at 11 P. M. Quin. grs. x.

May 1*st*, 1 A. M.—Pulse 96, temperature 102. Bowels moved again. Morph. gr. $\frac{1}{6}$. Mouth very dry.

5 A. M.—Pulse 100, temperature 103.2. Evacuation of bowels. No tympanites. Quin. grs. x, morph. $\frac{1}{8}$ in enema.

8 A. M.—Pulse 100, temperature 102. Slight chills.

10 A. M.—Considerable puffiness, and some sensation of elasticity, or fluctuation, over left half of the abdomen and

renal region. Two exploring punctures without result. Restless. Morph. gr. $\frac{1}{6}$.

5 P. M.—Pulse 88, temperature 102.7. Stomach washed out again; Leube into stomach, does not appear to be retained. Fluids taken by the mouth rush through fistula. Incision about four inches to the left of fistula through skin and muscle down to fascia transversalis. Some little hæmorrhage. Discharge of pus partly thin and offensive, partly laudable. Injections of carbolic acid and water frequently repeated. Distinct communication of new incision with original wound, which meanwhile has reopened completely, and with fistula running upward and backward. Quin. grs. x, morph. gr. $\frac{1}{6}$.

2*d*, 2 A. M.—But little pus, not of bad quality; thirst.

6 A. M.—Pulse 94, temperature 101.3. Bowels moved.

8 A. M.—Quin. grs. x, morph. gr. $\frac{1}{6}$.

10 A. M.—Pulse 94, temperature 101.5.

12 M.—Morph. gr. $\frac{1}{6}$.

2 P. M.—Quin. grs. x.

5 P. M.—Since yesterday, in spite of reduction of temperature, and the complete retention, in the rectum, of the injected meat-solution and milk, the general condition of the patient is decidedly worse. Pulse small, features haggard, expression of collapse; skin cool, veins unusually visible. Transfusion of four or five ounces of defibrinated blood from the arm of the house-physician, Dr. Froelich, into the median basilic of the patient. No very visible effects, except on the features, which look less haggard.

6 P. M.—Pulse 100, temperature 103.8. Face has a cyanotic hue, respiration becomes labored.

8 P. M.—Temperature, 106.3. Profuse perspiration, hands cold, mouth dry, pulse hardly perceptible. Consciousness unimpaired.

9 P. M.—After brandy-and-milk injection, pulse 108, temperature 104.5. Respiration labored and hurried, 48 a minute, extremities cold. Perspiration still profuse.

12 M.—Temperature 102.5, pulse perceptible, but cannot be counted.

3*d*, 2 A. M.—Quinia, grs. x, and beef-solution injected, but not retained—the first time they are expelled.

4 A. M.—Temperature 105, pulse innumerable, great dyspnœa, consciousness intact. Enema of milk-and-brandy retained.

6 A. M.—Died very quietly.

The *post-mortem* examination could not be extended beyond the abdominal cavity. The blood-vessels of the mesentery and the peritonæum, especially of the left side, and particularly on intestine, greatly dilated, but no effusion, no liquid of any kind in the abdominal cavity, no adhesions whatever between any portion of the peritonæum, except around the wound of the abdominal wall and the fistula. The stomach was opened one inch and a half from the pylorus, midway between the small and large curvature; closely attached and adhering over a surface from a quarter to half an inch, to the peritonæum of the abdominal wall. Two tiers of fistulous openings extended from the original wound to the left, in the direction of, and beyond the counter-opening at the side of the abdomen; one in the subcutaneous tissue, the other between muscles and transversalis.

As epicritical remarks, I should offer the following: The operation was not a difficult one to perform.

The patient, it is true, had been sick for a very long time, thirteen years, but had always shown and again exhibited a wonderful vitality.

She was not reduced to such a degree as many of the other fourteen cases which I shall have to mention. Thus she had fair chances, not to outlive her sickness, but to enjoy the taking and assimilation of food, and to die of gradual exhaustion, rather than of hunger and thirst.

The first days after the operation were favorable. Little fever, moderate erysipelas, both passing by.

Rectum in excellent condition, every injection being retained.

On and after the sixth day a new fever, from purulent infiltration of subcutaneous and muscular tissue, commencing, no doubt, in the original wound.

The impaired condition dates from that fact and that day.

Could septicæmia have been prevented? Possibly. I have remarked that the handle of the scalpel was used more

than the knife in penetrating the tissues outside the fascia transversalis. This is safer, as far as hæmorrhage is concerned, but it may tear more tissue than a knife cuts, and thereby the possibility of infiltration may be enhanced. This, however, is not all. I believe it doubtful if carbolic-acid applications from the beginning would have prevented untoward occurrences; but what is hardly doubtful to me is, that the firm closure of the external wound has proved injurious. I mentioned that for that purpose I employed a Carlsbad pin and two sutures besides, which were removed on the fifth day. Below this firm cover, through which liquids could not escape, serum, or drops of liquid running down from the stomach, would decompose and give rise to all the dangers described above. Besides, the mass of the stomach, sewed fast in the longitudinal straight wound of the abdominal wall, caused the abdominal wall, particularly the peritonæum and the skin, to be thrown up in a fold, again facilitating irregularities in the course of the healing process, giving rise to a little liquid being stowed away. Therefore, in my next operation, I propose to attach the stomach firmly all round the wound of the peritonæum and the corresponding portion of muscle and integument, but to leave the external wound open, and subject to antiseptic treatment.

I consider this point of great weight in the further development of this important operation; it may serve as a further illustration of the chances for good lying hidden in every failure. The fourteen cases of gastrotomy performed for the same reason as mine—two French, one Danish, nine English, one German, and one American—yield a very interesting contribution to this subject. It is a brief history, and briefly told.

After John Watson and Ch. A. Egeberg (1839) and others had already proposed gastrotomy for œsophageal stricture, Sedillot, professor in Strasbourg, presented, in July and November, 1843, to the Académie des Sciences of Paris two papers, in which he proposed that operation for the purpose of introducing food into the stomach in all those cases in which a stricture of the œsophagus rendered the normal introduction of food impossible. He insisted upon the fact that death was certain in all of these cases; that the patients, suffering from

hunger and still more from thirst, were always anxious to undergo any operation undertaken in their interest. Leroy d'Etiolles introduced an ivory ring into an œsophageal stricture; it gave rise to such serious symptoms as to necessitate œsophagotomy. Taranget performed œsophagotomy for the same purpose, prolonging life about sixteen months. But even œsophagotomy is an impossibility whenever the stricture is located below the cricoid cartilage. Sedillot referred also to the success attending the experiments of Blondlot, who was the first to establish gastric fistulæ in the animal, and to those cases in which fistulæ of the stomach resulted from accidents, or from an operation undertaken for the purpose of removing foreign bodies.

His first operation[1] was performed on November 13, 1849, under chloroform, on a man of fifty-two years, who had suffered from stricture of the œsophagus for a year past. Incision crucial, under the ensiform process, to the left, through skin, subcutaneous tissue, muscle, fascia, and peritonæum. The stomach, after the omentum had been pushed aside, was drawn out and punctured. The aperture was filled with a tube, consisting of two grooved halves armed with prominences destined to retain the stomach *in situ*. An elastic sound was introduced through this tube, and the whole apparatus fastened outside. The stomach was then replaced in the abdominal cavity, but sank to an unexpected distance, drawing the tube after it to a considerable extent. After some hours chicken-broth was injected, but part of it flowed out again. The patient slept till midnight, grew feverish, and died at 7 A. M. In the abdomen reddish serum, ecchymoses round the wound of peritonæum, omentum slightly reddened and ecchymotic. Aperture of stomach near cardia also surrounded by ecchymoses; two hundred grammes of a greenish liquid in the stomach. On a level with the sixth rib, there was an epithelioma of the œsophagus, causing the stricture.

In regard to the cause of death, the opinions differed greatly. The influence of chloroform, the debility of the patient, compression of the pneumogastric nerve in the tumor, the entrance of air into the abdominal cavity, were equally held re-

[1] *Gazette de Strassbourg*, 1849, No. 12.

sponsible. Besides, Sedillot resolved to improve the method of operating in two points, firstly, by sewing the stomach to the integuments; secondly, by avoiding injections into the stomach.

He performed his second operation, January 20, 1853, on a man of fifty-eight years.[1] Incision as in his first case. The stomach was drawn out by means of pincers, and six sutures introduced through peritoneal and muscular layers of the stomach, and attached to the integuments, so that the stomach covered the wound from inside. The stomach was not to be opened until sufficient adhesions between the two peritoneal layers had formed. An hour afterward. the patient had a severe attack of coughing, part of the sutures tore through, and the stomach escaped. Sedillot drew it out again and held it to the abdominal wall with his pincers, which were tightly closed. Next day fever, inflammation of wound, and diarrhœa. Leeches, injections of opium into the rectum, and leeches again. On January 25th, gangrene round the wound, pincettes and sutures removed, adhesions formed. A greenish fluid flowed out of the stomach; abdomen not large nor painful. Wine and beef-broth injections into the stomach, through a tube closed by a cork. Fever on the 27th, filiform pulse and chills on the 28th. Death on the 30th. There were pus in the abdominal cavity, and recent adhesions between omentum and intestines. Stomach firmly adhering to the peritonæum of the abdominal wall. The aperture two centimetres wide, one long, in the centre of the anterior wall. Liver large, lungs adhering, old tubercles. Cancerous tumor in œsophagus, at and below sixth cervical vertebra.

E. Fenger's patient[2] was a man of fifty-five years. His premonitory symptoms had not lasted more than three months, the first being pain in deglutition. Ten days after the first symptoms, he was unable to take solid food. The stricture, thirteen inches behind the teeth, was cancerous. No manifestations of the disease anywhere. Some infiltration (inflammatory) in the apices of both lungs. The operation was performed under chloroform, March 23, 1853. The incision was made from the point of sternum downward and to the left,

[1] *Gazette de Strassbourg*, 1853, No. 3; *Union Méd.*, March 31, 1853; *Gazette des Hôp.*, April 2 and 5, 1853.

[2] *Virchow's Archiv*, vi., 1854.

along the margin of the costal cartilage. On the same day oatmeal-gruel, and some time after milk, were poured into the stomach through a funnel; death after fifty-eight hours. At the *post-mortem* examination, close attachment, but no adhesion was found between the stomach and abdominal wall. Very little peritonitis. The aperture was two and a half inches from the cardia to the right, near the large curvature.

J. Cooper Forster operated twice. His first case[1] was a man of forty-seven years, who suffered from epithelioma of the œsophagus, about the level of the manubrium sterni, and was first subjected to tracheotomy, which did not relieve his dyspnœa, and to gastrotomy, on March 26, 1856. He died near the end of the second day. No peritonitis. Tubercles and emphysema in the lung.

His second operation[2] was on a boy of four years and four months, for corrosive cicatrization. It was performed, in 1859, under chloroform. He was fed with milk, eggs, and wine hourly, and died on the fourth day, of recent peritonitis. Although the aperture was not too near the cardia, the sutures had torn through, and foreign substances were found in the abdomen.

Sidney Jones's first case[3] was a woman of forty-four years. Deglutition and breathing had been difficult since July, 1858; tracheotomy was performed on February 10, 1859; in May an elastic tube of No. 12 could no longer be passed; no food entered the stomach after the beginning of June, so that she was fed by enemata for five or six weeks. Gastrotomy was performed on July 14, 1859. The incision was vertical downward from the cartilage between the eighth and ninth ribs, the stomach fastened by five or six silk ligatures; milk-and-brandy were introduced into the stomach every two hours, and a good deal of retching experienced. She died thirty-six hours after operation. Aperture midway between pyloric and cardiac ends, and between small and large curvatures. Stomach adherent to abdominal wall. No peritonitis. The only cancerous deposit found in the body was from the pharynx down to the cricoid cartilage.

He also operated[4] on a man of sixty-one years, whose first

[1] S. O. Habershon in "Guy's Hospital Reports," third series, iv., 1858.
[2] "Guy's Hospital Reports," third series, v., 1859.
[3] "Transactions Pathological Society," xi. [4] *Lancet*, Dec. 15, 1866.

symptoms—dysphagia and vomiting—dated from the 20th of May, 1866, and in whom the sound did not pass the cardia on the 22d of September.

After the operation, brandy, egg, and milk, were introduced into the stomach directly through a tube which was not left in the stomach, but introduced for that purpose every two hours, or a little less frequently, after the fifth day. Beef-tea was added after some time. Pulse ranged for a long time from 60–78, temperature from 98–100. Two of his sutures were removed on the 1st of October; some pus followed their removal. He died on the 3d, or the eleventh day, of pneumonia; gray hepatization being found in the right lower, red hepatization in the left lower lobe. Opposite the first and second dorsal vertebræ was a hard tumor, scirrhous and encephaloid, involving the wall of the œsophagus and encroaching upon, but not ulcerating, the mucous membrane. The canal very narrow and tortuous. In the left kidney an encephaloid deposit.

Curling's case [1] was in a man of fifty-seven years, who had suffered but four weeks when admitted on January 30, 1866. Emaciation rapid. Operation March 31, 1866, under ether. Incision three inches long, vertically downward from the end of the seventh rib. Stomach fastened with five stout silk sutures. Milk was injected after the operation, and gave pain which required morphia. Enemata were retained; no vomiting. Death after thirty-two hours, of exhaustion. Opening on great curvature close to cardiac end. One of the upper sutures had ulcerated out. Tissues around the incision discolored, blood extravasated into them. The tumor was an epithelioma which approached to colloid in the deeper layers, six inches below glottis. Besides, there were emphysema, fatty heart, atheromatous aorta and arteries, soft muscles.

Von Thadeu's patient [2] was a woman of fifty-four years, suffering from epithelioma, located about two inches above the cardia. Dysphagia had lasted a year, vomiting after some time, no pain. Injections of food into the rectum did not sustain her. Operation (1867) under chloroform. Incis-

[1] "London Hospital Reports," iii.

[2] Schartfenberg: "Dissertatio inauguralis de gastrotomia propter œsophagi stenosin instituta, Kiliæ, 1867.—Schmidt's Jahrb., 136.

ion three inches long, from the ensiform process downward and to the left, near the margin of cartilages. Three arteries were ligated; four sutures fastened the stomach to the lower angle of wound. The upper portion of external wound was united by nine sutures; the incision into the stomach, however, postponed till the next morning. After the operation, pain, in spite of morphia, and vomiting of acid fluids. Abdomen sunk, wound drawn in, funnel-like. The stomach was finally drawn up by the sutures and incised, the mucous membrane fastened by two sutures. Injections of beef-broth through a thin elastic catheter, repeated several times. No pain. Next morning two movements of the bowels. Temperature elevated; pulse accelerated; death forty-seven hours after the operation. The inner opening of stomach was but of the size of a pea, near the pylorus. Very little peritonitis, and only near the wound.

Francis Troup's[1] patient was a man of fifty years. The preceding symptoms were loss of appetite, gnawing pain, dysphagia, vomiting, thirst; the stricture resulted from the presence of an epitheliomatous mass at the cardiac end. He operated (1867) by a straight incision, three inches long, midway between middle line and costal cartilage, and inserted a tracheotomy-tube, through which milk and stimulants were introduced for three days—death on the fourth. The opening was found in the middle of the anterior wall of stomach. Adhesion partially perfect. No peritonitis.

Durham's case[2] was in a man of seventy years, without any hereditary disposition, suffering from an epithelioma above the level of bifurcation, with a slit-like ulceration into the trachea. He was admitted August 19, 1868, after having had a constant desire to expectorate for many months, and vomiting since June. After September 10th he swallowed nothing, and the operation was performed on the 15th. Incision of three inches from the cartilage of eighth and ninth ribs, so that the outer border of the rectus muscle was just seen. The opening was near the large curvature, and near the cardia, the stomach fastened with silk. On incising, and in introducing

[1] *Edinburgh Medical Journal*, July, 1872.

[2] "Guy's Hospital Reports," third series, xiv., 1869.

milk into the stomach, a dragging pain was experienced. Death, sixteen hours after operation.

Maury's patient[1] was a man of twenty-five years, with a history of indurated chancre and buboes at the age of seventeen years. On the 17th of May, 1868, he was suddenly seized with a choking sensation and a violent fit of vomiting. These paroxysms soon returned almost daily. In July a stricture was discovered near the cardiac orifice. A sound could be passed but once. No pain. In April, 1869, confined to bed through weakness; rallied after a few weeks, but again sank. Could not swallow any thing about the middle of May, and was sustained by beef-extract and milk-punch injections, which were mostly retained. Complains more of hunger than of thirst. Operation June 25, 1869, under chloroform. Incision curvilinear, convexity toward median line from sternal extremity of seventh intercostal space, down and outward for four inches. Rectus muscle, fascia transversalis, and peritonæum having been divided, the stomach was incised near pylorus, and fastened with numerous silver sutures. A tube was inserted at once, and beef-tea frequently injected. He commenced to sink soon after the operation, and died after twelve hours. "There was a close, firm stricture of the œsophagus just within its cardiac orifice, which produced such complete obliteration of its calibre as scarcely to admit of the passage of a probe. No evidence of ulceration; stomach contracted, empty, and healthy. The opening made was about two inches from pyloric valve. No tension or strain upon the sutures. Microscopical examination revealed that much, that the tumor was probably not cancerous."

John Lowe[2] operated on a woman, fifty-one years old. September 24, 1869. First symptoms observed two years before operation. A scirrhous tumor about cricoid cartilage and base of neck for nine months; no solid food for seven months. Chloroform dispensed with after trial. The incision was conical, one and a half inch long, two fingers' breadth to the inner side of the costal cartilage. Four silver sutures through the stomach, avoiding the peritonæum. Silver tube one and a half inch long introduced at once. After

[1] *American Journal of Medical Sciences*, April, 1870.

[2] *Lancet*, July 22, 1871.

considerable relief, patient died suddenly on the third day. Wound looked healthy, integuments and stomach were united. No other inflammation. Serum ℥iv in pericardium; heart fatty, soft; in the aorta a large, firm, colorless clot; the right auricle full of liquid blood. Death appears produced, therefore, not as Mr. Lowe thinks, "by the clot in aorta as the only assignable cause, due to prolonged fasting changing the blood, and shock of the operation," but to paralysis of the heart, between systole and diastole.

Bryant[1] operated on a man with œsophageal stricture. He made an oblique incision along the lower border of the ribs, commencing at the linea semilunaris, with the view of catching the cardiac end of the stomach. He picked up the stomach with his fingers very readily. The patient lived five days; the operation had nothing to do with the death, and the local repair was most complete.

The fifteen cases reported or quoted by me are all the known cases of gastrotomy undertaken for the relief of stricture of the œsophagus. It being taken for granted that all the reasons for an operative proceeding are found correct, is not œsophagotomy an operation to be preferred to gastrotomy? When the stricture is at the very upper end of the œsophagus, not extending below the cricoid cartilage, the œsophagus might be opened, and the danger of peritonitis and the difficulties of after-treatment in gastrotomy avoided. Now, statistics prove but little, where the numbers are only small and the individual cases vary so much. Since the time of John Watson, who performed œsophagotomy in 1843, on a man twenty-four years old, for stricture of the œsophagus, with the result of keeping the patient alive for three months, the operation has been repeated a few times. De la Vacherie operated on a man, sixty-eight years old, in 1846. Death after five days. Von Bruns, on a man thirty-eight years old, for struma, in 1859. Death after ten days, from erosion of veins and pyæmia. On another man thirty-seven years old, in 1865; death after five weeks. Willet, on a woman, for carcinoma, in 1868; death after eighteen days. Billroth, on a man with carcinoma of œsophagus, and perforation of trachea; death after one day. Besides these six cases, I find three others quoted from Terrier

[1] "Practice of Surgery," p. 293.

("de l'Œsophagotomie Externe," Paris, 1870), one of which I have quoted above. They are said to have taken a much more favorable turn. One of the cases quoted by Tarangget is said to have lived sixteen months, one three months, after the operation.

There is a very general objection to œsophagotomy, viz., the difficulty of its performance. Where the access from pharynx is very easy; where a Vacca instrument, or another "Ektropœsophage" can be introduced to guide the operator; where the general condition of the patient is good (as in the uncomplicated presence of a foreign body, for instance), the operation is a difficult one to perform, but may not offer insurmountable obstacles. But in cases of stricture we have to deal with an œsophagus more or less inaccessible from above, thus lacking guidance from within, and in the very neighborhood of a pseudoplasm. The position of the œsophagus, between the vertebral column and larynx, muscles, vessels, etc., is confined in a narrow space, and changeable to but a small degree. As it has to be fastened to the integuments, a great deal of straining would be required. The neighborhood of the pseudoplasm, its intimate connection with the surrounding parts, will encumber the whole mass and render it less movable. The tissue of the œsophagus, where the incision will have to be made, may participate already in the process, or soon be implicated. For neoplasms will rest only when not irritated. Besides, the patient is feeble, emaciated, perhaps nearly dying, and unfit to undergo an operation of such severity as œsophagotomy.

On the other hand, wounds of the stomach are known to heal kindly. The celebrated cases reported in every text-book on physiology, and the thousand experiments since Blondlot's, on animals living with gastric fistulæ, are fair illustrations. One thing is certain, that human beings have lived many years with gastric fistulæ; which has not been proved yet in a case of œsophageal fistula. Peritonitis must be feared, but neither in my case, nor in others I have compared with mine, was it a dangerous feature. In many the direct statement is made that no peritonitis, or but little, was found; on the contrary, there are but two cases in which purulent peritonitis is asserted to be the cause of death; there is another with py-

æmia, another with fatty heart and paralysis, one with extensive pneumonia, and a number in which the late hour at which the operation was performed and subsequent exhaustion were the direct causes of death.

The experience of our ovariotomists goes also to show that the dangers of traumatic peritonitis have certainly not been underrated. Thus gastrotomy, being an operation which does not implicate large blood-vessels, and does not require an unusual degree of operative dexterity, is surely preferable. It is true that the results of the fifteen operations hitherto performed do not look encouraging. But they were, almost all of them, made in persons on the point of death, and with unripened experience. When you look over the number of cases here quoted, you find several points, in both operations and after-treatment, which our advanced knowledge upon abdominal wounds would hardly approve of. Thus, the first operator punctured the stomach, but did not fasten it by sutures; in his second case he did the latter, but did not puncture. When the sutures tore out in a violent coughing-spell, he fastened the stomach to the abdominal wall by means of pincers. Another, as late as 1866 (Von Thaden), employed sutures, and a puncture which was too small. Some made it a point to open the stomach near the fundus, the curvatura major, just the very portion which, in case of recovery, would be expected to attend to the greater part of gastric digestion. Some, like Durham, insist upon incising near the cardia. The aperture near the cardiac end must necessarily, after attachment at the abdominal wall is complete, give rise to straining and pulling. It is only in cases like that of Maury, who intentionally opened the stomach near the pylorus, that "tension and straining" are avoided. Besides, it is not always easy, it appears, to avoid an improper locality. Curling commenced his operation at the seventh rib in one case, anteriorly, and came out nearer the cardia than was desirable.

Other differences of proceeding appear in the after-treatment. When is adhesion to be expected? When are the sutures to be removed? Adhesive inflammation will not always set in at the same time in different individuals. The treatment itself may retard it; application of ice certainly will.

Sidney Jones found adhesion in thirty-six hours in one case. In another he allowed the sutures to remain eight days, and met with suppuration in the stitches in consequence.

The mode of opening of integuments may not appear important enough to be here mentioned. Still it is not an indifferent matter whether, if the pyloric portion is to be opened —as it ought to be—the linea semicircularis is selected for the first incision (Durham, Forster in one case), or the rectus muscle a little farther to the left. Nor is it absolutely indifferent whether a longitudinal, or conical (Sedillot), or curvilinear (Maury) incision is made. Cutting through the axis of the muscle ought to be positively avoided.

Nor does it appear that the methods of the after-treatment, as far as feeding is concerned, have all been satisfactory. My case permitted of enlisting the services of the rectum to an unusual extent. Many operators have not even tried to render it serviceable. Maury states that feeding through the rectum proved insufficient in his case. It is an unfortunate fact that the strength of all the patients is so reduced as to weaken the sphincters. Only when operations shall in future be made in due time, before complete exhaustion has set in, will the feeding, for five or six days, through the rectum be feasible and effective. Only by sufficiency of the sphincters is it possible to explain the fact that Barlow could keep a patient on rectal injections exclusively for seventy days.

Instead of waiting a reasonable time before introducing food into the opened stomach, many operators have done so when the stitches had scarcely been applied. Forster fed every hour; in one case the sutures tore out. Some have fed through a funnel, some injected through a catheter (like Curling, who mentions pain as a constant result of every injection). Some allow the funnel to remain, another introduces it each time. I need not say that I prefer to rely on the rectum for some days, until I have reason to believe in adhesion of the two adjoining peritoneal surfaces being established. I should no more think, if I could help it, of exciting peristaltic motion in the stomach subjected to recent gastrotomy, than of administering a drastic in a common case of entero-peritonitis. As far as the selection of time for the operation is concerned, we shall not always have to decide that point. But, when the

physician has any control over his patient and his case, he ought to operate in time. If Maury's case of malignant (probably syphilitic) stricture of the cardiac end of the œsophagus had been operated upon a few weeks previous to absolute exhaustion, it is not difficult to believe that he would not only not have died a few hours after the operation, but might have been subjected to specific and sufficiently powerful treatment, the hyperplastic swelling have been reduced, the œsophagus reopened, the gastric fistula healed, and the patient be a well man to-day.

In view of all I have said, after I have spoken of its indications, difficulties, and promises, of its advantages over œsophagotomy, I need not again plead for gastrotomy as a justifiable operation. Colotomy has conquered its place in strictures of the lower, gastrotomy will obtain it in those of the upper portions of the digestive tract. It is, moreover, a peculiar feature common to both, that their diseases will run their course, usually, without many complications, or without metastatic processes. Besides, neither rectum nor œsophagus is a vital part. They are conveniences, not necessities; at all events, life can exist without them. Billroth has proposed the entire removal of a diseased portion of the œsophagus if accessible. It is true, many of us would rather lose life than either œsophagus or rectum; but not many of us would rather die violently of hunger and thirst, than of slow and peaceful exhaustion. And patients suffering from œsophageal stricture are narrowed down to choosing between the two latter necessities.

Gastrotomy will hold a position similar to that of tracheotomy in point of dignity, but not in frequency of performance. The larynx is not a vital organ. It may be circumvented, as in croup or laryngeal pseudoplasm, by opening the trachea, or it may be removed altogether, as has been done by Billroth. It is not many years since we disclaimed the justifiability or necessity of tracheotomy in croup; to-day I know that very many of my youngest *confrères* not only defend tracheotomy as a necessary operation, but have even pronounced, long since, that every physician ought to know how to perform it *propriis manibus*.

	Year of Operat'n.	Sex.	Age.	Disease.	Time of Death after Operation.	Cause of Death, and *Post-Mortem* Appearances.	Where Reported.
1. Sedillot	1849.	M.	52	Epithelioma of lower third of œsophagus.	Twenty-one hours.	Chloroform ? *Exhaustion ?* Moderate peritonitis.	"Traité Méd. Opér.," ii., 272. Gaz. de Strasbourg, 12, 1849.
2. Sedillot	1853.	M.	58	Cancer in lower third of œsophagus.	Tenth day.	*Purulent peritonitis.* Stomach firmly adhering.	Gaz. de Strasb., 3, 1853. Union Méd., March 31, 1853. Gaz. Hôp., April 2 and 5, 1853.
3. Fenger	1853.	M.	55	Cancer in middle third of œsophagus, thirteen inches from teeth.	Fifty-eight hours.	*Exhaustion.* Little peritonitis; close attachment, but no adhesion as yet.	Virchow's Arch., vi., 1854.
4. Cooper Forster.	1856.	M.	47	Epithelioma of œsophagus.	Second day.	*Exhaustion.* No peritonitis. Tubercles and emphys. in lungs.	S. O. Habershon, in Guy's Hosp. Rep., third series, iv., 1858.
5. Cooper Forster.	1859.	M.	4	Corrosive stricture.	Fourth day.	*Peritonitis.* Sutures torn out. Foreign substances in abdominal cavity.	Guy's Hospital Reports, third series, v., 1859.
6. Sidney Jones..	1859.	F.	44	Scirrhus of phar. and œsoph. above cricoid cartilage.	Thirty-six hours.	*Exhaustion.* No peritonitis.	Transactions of Pathological Society, xi.
7. Sidney Jones..	1866.	M.	61	Scirrhus of lower portion of œsophagus and cardia.	Eleven days.	*Pneumonia.* Gray hepat. right lung, red hepat. left lung. No peritonitis. Stomach adhering. Encephaloid deposit in left kidney.	Lancet, December 15, 1866.
8. Curling.....	1866.	M.	57	Epithelioma six inches below glottis.	Thirty-two hours.	*Exhaustion.* No peritonitis. Emphysema, fatty heart, atheromatous aorta and arteries, soft muscles.	London Hospital Reports.
9. Von Thaden...	1867.	F.		Cancerous stenosis of pharynx.	Forty-seven hours.	*Exhaustion.* Very little peritonitis, and only near the wound.	Scharffenberg, gastrotomia propter œs'phagi stenosin instituta. Kiliae, 1867. Schmidt's Jahrb.
10. Durham	1868.	M.	70	Epithelioma of middle third.	Sixteen hours.	*Exhaustion.*	Guy's Hos. Rep., 3d s., xiv., 1869.
11. Maury	1869.	M.	25	Syphil. (?) strict. of cardia.	Twelve hours.	*Exhaustion.*	Am. Jour. Med. Sc., April, 1870.
12. Lowe	1869.	F.	51	Scirrhus of œsophagus and pharynx.	Third day.	*Paralysis of heart.* "Clot in aorta, and shock after operation."	Lancet, July 22, 1871.
13. Troup	1867.	M.	50	Epithelioma of cardia.	Three days.	*Paralysis of heart.* No peritonitis; adhesion partial.	Edinburgh Medical Journal, July, 1872.
14. Bryant		M.	50	Stricture of œsophagus.	Five days.	No peritonitis.	"Practice of Surgery," p. 293.
15. Jacobi	1874.	F.	52	Scirrhus of œsophagus above and level with cricoid cart.	Tenth day.	*Septicæmia.* No peritonitis.	New York Medical Journal. August and September, 1874.

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